

**Table 1.1 Comparison of Basalt, Fiberglass and Silica Filaments**

PROPERTIES	SI UNITS	BASALT	FIBERGLASS	SILICA
<b>Thermal</b>				
Max application temp	°C	650°	600°	1100°
Max continuous operating temp	°C	600°	480°	1000°
Min operating temp	°C	-260°	-60°	-170°
Thermal conductivity	W/m K	0.031-0.038	0.034 - 0.040	0.035 - 0.040
Melt temperature	°C	1450°	1120°	1550°
<b>Mechanical</b>				
Density	g/cm <sup>3</sup>	2.75	2.6	2.15
Filament diameter	microns	9-23	9-13	9-15
Tensile strength	M Pa	4840	3450	4750
Compression	psi	550,000	440,000	510,000
Elastic modulus	G Pa	89	77	66
Elongation @ break	%	3.15	4.70	1.20
Absorption of humidity (65% RAH)	%	<0.1	<0.1	<0.1
<b>Acoustics</b>				
Sound absorption coefficient	%	0.9 - 0.99	0.8 - 0.93	0.85 - 0.95
<b>Electrical</b>				
Specific volume resistance	ohm.m	1*10 <sup>12</sup>	1*10 <sup>11</sup>	1*10 <sup>11</sup>
Loss angle tangent frequency	1 MHz	0.0050	0.0047	0.0049
Relative dielectric permeability	1 MHz	2.2	2.3	2.3
<b>Chemical Resistance</b>				
% weight loss after 3hrs boiling in:				
H <sub>2</sub> O	%	0.2	0.7	0.1
2n NaOH	%	5.0	6.0	5.0
2n HCl	%	2.2	38.9	15.7
<b>Price</b>		\$	\$	\$\$\$\$